

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1. (Previously Presented) An apparatus comprising:
walls enclosing a process chamber;
a wafer susceptor positioned within the chamber and adapted to support a wafer;
a first exhaust conduit located radially outward from the wafer susceptor, in fluid communication with the chamber and adapted to receive a first flow of gas passing substantially vertically from a gas distribution showerhead to an upper surface of the wafer and radially across the upper surface of the wafer to the first exhaust conduit; and
a gas distribution showerhead, the gas distribution showerhead being in fluid communication with a processing gas source and the process chamber, the gas distribution showerhead comprising:
a first channel in fluid communication with the processing gas source and with apertures distributed over a lower surface of the showerhead, wherein the apertures define a first area; and
a second channel separate from the first channel and in fluid communication with a second exhaust conduit and with exhaust apertures distributed over the lower surface of the showerhead, wherein the second exhaust conduit is adapted to receive a second flow of gas passing substantially vertically from the first channel to an upper surface of the wafer and substantially vertically through the second channel, the second flow of gas being independent of the first flow of gas and wherein the exhaust apertures define a second area and a ratio of the first area to the second area varies as a function of radial distance from the center of the gas distribution showerhead.
2. - 4. (Canceled)

5. (Previously Presented) The apparatus of claim 1 wherein the ratio of the first area to the second area varies linearly as a function of radial distance from the center of the gas distribution showerhead.

6. (Previously Presented) The apparatus of claim 1 wherein the ratio of the first area to the second area varies nonlinearly as a function of radial distance from the center of the gas distribution showerhead.

7. (Previously Presented) The apparatus of claim 1 wherein the ratio of the first area to the second area increases as a function of radial distance from the center of the gas distribution showerhead.

8. (Previously Presented) The apparatus of claim 1 wherein the ratio of the first area to the second area decreases as a function of radial distance from the center of the gas distribution showerhead.

9. (Original) The apparatus of claim 1 wherein the first exhaust conduit and the second exhaust conduit are in fluid communication with a common foreline.

10. (Previously Presented) The apparatus of claim 9 wherein the first exhaust conduit is in fluid communication with the common foreline through a first valve and the second exhaust conduit is in fluid communication with the common foreline through a second valve.

11. (Original) The apparatus of claim 1 wherein the first exhaust conduit and the second exhaust conduit are in communication with a common vacuum pump.

12. (Original) The apparatus of claim 1 wherein the first exhaust conduit and the second exhaust conduit are in communication with separate vacuum pumps.

13. - 35. (Canceled)

36. (Previously Presented) An apparatus comprising:
walls enclosing a process chamber;
a wafer susceptor positioned within the chamber and adapted to support a wafer;

a showerhead adapted to distribute a processing gas into the process chamber, the showerhead comprising:

a plurality of distribution apertures distributed over a lower surface of the showerhead, wherein the plurality of distribution apertures are in fluid communication with a source of the processing gas; and

a plurality of exhaust apertures distributed over the lower surface of the showerhead, wherein the plurality of exhaust apertures receive a first flow of gas passing substantially vertically from the plurality of distribution apertures to an upper surface of the wafer and substantially vertically through the plurality of exhaust apertures; and

a first exhaust conduit in fluid communication with the plurality of exhaust apertures and adapted to receive the first flow of gas and exhaust the first flow of gas from the process chamber through the first exhaust conduit;

wherein the plurality of distribution apertures define a first area, the plurality of exhaust apertures define a second area, and a ratio of the first area to the second area varies as a function of radial distance from a center of the showerhead; and

a second exhaust conduit separate from the first exhaust conduit, the second exhaust conduit being located radially outward from the wafer susceptor and adapted to receive a second flow of gas passing substantially vertically from the plurality of distribution apertures to the upper surface of the wafer and radially across a peripheral portion of the upper surface of the wafer to the second exhaust conduit.

37. (Previously Presented) The apparatus of claim 36 wherein the ratio of the first area to the second area varies linearly as a function of radial distance from the center of the showerhead.

38. (Previously Presented) The apparatus of claim 37 wherein the ratio of the first area to the second area increases as a function of radial distance from the center of the showerhead.

39. (Previously Presented) The apparatus of claim 37 wherein the ratio of the first area to the second area decreases as a function of radial distance from the center of the showerhead.

40. (Previously Presented) The apparatus of claim 36 wherein the ratio of the first area to the second area varies non-linearly as a function of radial distance from the center of the showerhead.

41. (Previously Presented) The apparatus of claim 36 wherein the first exhaust conduit and the second exhaust conduit are in fluid communication with a common foreline.

42. (Previously Presented) The apparatus of claim 41 wherein the first exhaust conduit is in fluid communication with the common foreline through a first valve and the second exhaust conduit is in fluid communication with the common foreline through a second valve.

43. (Previously Presented) The apparatus of claim 36 wherein the first exhaust conduit and the second exhaust conduit are in fluid communication with a common vacuum pump.

44. (Previously Presented) The apparatus of claim 36 wherein the first exhaust conduit and the second exhaust conduit are in fluid communication with separate vacuum pumps.

45. (Previously Presented) The apparatus of claim 1 wherein the lower surface of the gas distribution showerhead consists of a substantially planar surface opposing the wafer susceptor.

46. (Previously Presented) The apparatus of claim 45 wherein the apertures distributed over the lower surface and the exhaust apertures distributed over the lower surface are distributed in a single plane defined by the substantially planar surface.

47. (Previously Presented) The apparatus of claim 36 wherein the lower surface of the showerhead consists of a substantially planar surface opposing the wafer susceptor.

48. (Previously Presented) The apparatus of claim 47 wherein the plurality of distribution apertures and the plurality of exhaust apertures are distributed in a single plane defined by the substantially planar surface.